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THE MESOSTIGMATIC NASAL MITES OF BIRDS. IV. THE SPECIES AND HOSTS OF THE GENUS RHINONYSSUS

(ACARINA, RHINONYSSIDAE)

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In this paper is presented a description of a new species, a redescription of an old species, and a key to the species thus far known. *Rhinonyssus novae-guinea* Hirst, (1921:769) is removed from the genus. Hirst figured and described only the ventral side of the female and did not describe the chela. Hence, it is impossible to assign it definitely to its correct genus at present. At first glance, it strongly resembles a *Rhinonyssus* but the segmented portion of the palp is considerably longer than the basal portion and its host is not one of the water birds. These two factors are sufficient to exclude it from *Rhinonyssus.*

According to Trouessart (1894), bird nasal mites have been known since 1871, when Nitzsch found specimens in the goatsucker, *Caprimulgus europaea* (subsequently described by Giebel as *Dermanyssus nitzschi*). Trouessart pointed out that they were not related to the Dermanyssidae but seemed to be related to the pteroptids (=Spinturnicidae). But in 1895 he stated that they are as distinct from the pteroptids as from the dermanyssids and proposed a new subfamily, Rhinonyssinae (the genus *Rhinonyssus* he described in 1894). Trouessart further recognized that nasal mites were to be found in chickens, geese, cuckoos, and many other birds, but he described only a very few species. Among those described were *Rhinonyssus coniventris* and *Sternosstoma rhinolethrum.* The former is the genotype of *Rhinosyssus*, and the latter has been transferred to that genus.

Rhinonyssus Trouessart, 1894:723

Type.—*Rhinonyssus coniventris* Trouessart. Type by monotypy.

Synonym.—*Somatericola* Tragardh, 1904:28. Type *Sommatericola levinsini.*

Sternostomum Trouessart, 1895:393 (emendation of *Sternostoma* Berlese et Trouessart, 1889) is given as a synonym of *Rhinonyssus* by Vitzthum, 1935, and by Castro, 1948. However, the present writer is not at all in sympathy with considering *Sternostomum* an entity distinct from *Sternostoma.* Trouessart clearly stated that *Sternos-*

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toma had the wrong ending according to Rules of Zoological Nomenclature and he was therefore correcting it to *Sternostomum.* He even mentioned the original species as genotype (*S. cryptorynchum*). But because Trouessart described *rhinolethrum* under this name, and which is obviously not a *Sternostoma,* Vitzthum (1935) stated that *Sternostomum* must be recognized as valid and distinct from *Sternostoma,* and that *rhinolethrum* is its genotype. But we are of the opinion that the names *Sternostoma* and *Sternostomum* should be considered as identical and that *rhinolethrum,* which is not a *Sternostoma,* should be removed to its proper genus, which is *Rhinonyssus,* as de Castro has done (1948).

The genus *Rhinonyssus* may be defined as mites of medium to large size; lacking a peritreme; having a single dorsal podosomal shield or a group of platelets in the podosomal region; the sternal plate lacking or greatly reduced; the anal plate also lacking or drastically reduced; the segmental portion of the gnathosomal palps shorter than the basal portion; the chelate portion of the chelicera at least 1/7 or more of the total length of the chelicera; lacking deutosternal teeth; lacking a modified forked seta on the palp tarsus and with no trace of a tritosternum.

They have been found in the Colymbiformes, Anseriformes, and in some of the Charadriiformes (Charadriidae, Scolopacidae, Recurvirostridae, and Alcidae; but not in the Laridae, which have their own peculiar mite of another genus).

Key to Species

1. Anal plate present though rarely fully developed; gnathosomal palps with stubby, short and thick, spine-like setae 2
No trace of an anal plate. Palpal setae otherwise 3
2. Ventral setae attenuate; anal plate narrow and with a few lines, the anal setae rarely on the plate. Parasites of Anseriforme birds .... *rhinolethrum*
Ventral setae blunt; anal plate broadly oval and bearing two setae. Parasites of Colymbiforme birds .... *alberti,* n. sp.
3. Anal pore dorsal; vestiges of a sternal plate. Sixteen or more ventral setae. Parasites of the Blacknecked Stilt (*Recurvirostridae*) .... *himantopus*
Anal pore ventral; no traces of a sternal plate. Ventral setae 8 or less 4
4. Only four ventral setae on the hysterosoma; two anterior and two posterior to the anal pore. Parasites of the auks (Alcidae) .... *caledonicus*
Eight ventral setae, six of which are anterior to the anal pore 5
5. Sternal setae all very short and not attenuated. (Examples of this species not seen by the writer). Parasites of auks—(Alcidae) .... *waterstoni*
Sternal setae may be short and heavy but at least the third pair is appendiculate. Parasites of small wading birds (plovers and sandpipers) .... *coniventris*

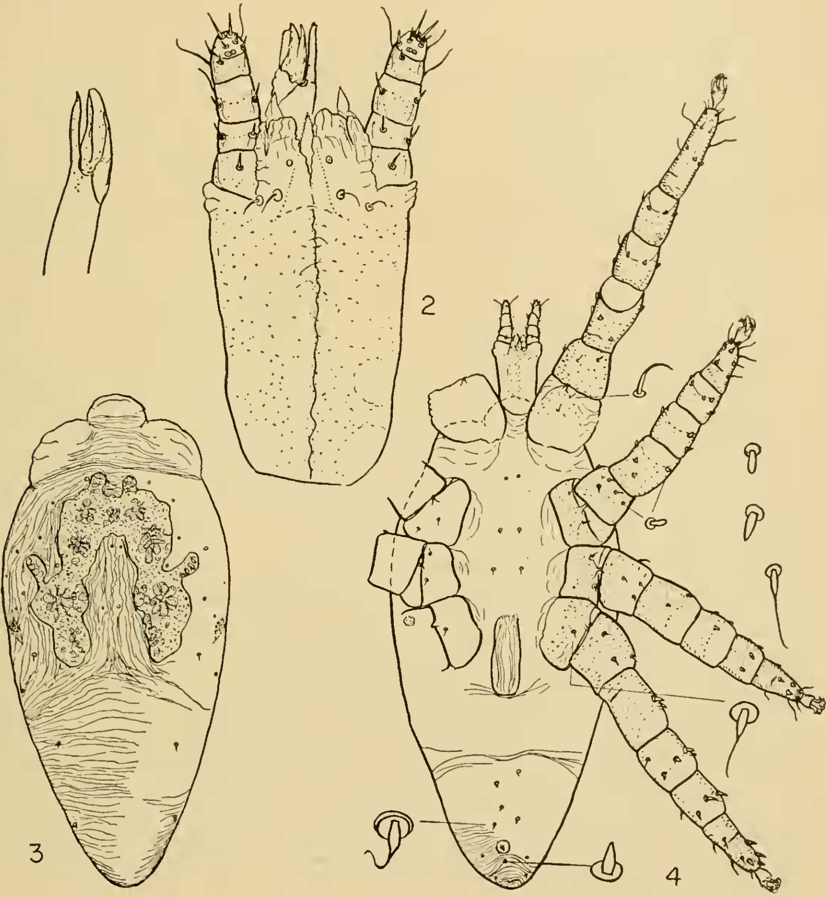
Rhinonyssus coniventris Trouessart

(Figs. 1, 2, 3, 4)

Rhinonyssus coniventris Trouessart, 1894:723; described but not illustrated. Hirst 1921:361; gives a very brief description and illustrates the ventral view of both male and female. Vitzthum, 1935. de Castro, 1948. Strandtmann, 1951: 130; illustrates dorsal and ventral views of both sexes and gives details of the gnathosoma.

Synonyms.—Rhinonyssus echinipes Hirst, 1921: 359; type host, *Charadrius hiaticula,* the ringed prover.

Rhinonyssus neglectus Hirst, 1921:359; type host, *Erolia maritima,* the purple sandpiper.



Rhinonyssus, coniventris Troussart: fig. 1, male chela; fig. 2, female gnathosoma, ventral view; fig. 3, dorsum of female; fig. 4, ventral view of female with sternal setae enlarged at right.

The mite varies in length from about 1400 μ to 2400 μ. It was redescribed by Strandtmann in 1951. Trouessart originally described it as being 2-3 mm. in total length and having stubby legs, the first pair being longest.

The type host was *Strepsilas interpres* (=*Arenaria interpres*), the turnstone.

Trouessart mentioned that a similar species, or a variety, was to be found in *Totanus calidris,* a yellow legs. Hirst's *neglectus* was found in *Erolia maritima,* the purple sandpiper; and his *echinipes* was found in *Charadris hiaticula,* the ringed plover.

We have found it in the following hosts:

Plovers: Arenaria interpres, the ruddy turnstone; Galveston, Texas; March 26, 1947; and May 29, 1948; 2 mites— a male and female.

Charadrius hiaticula, the ringed plover; Galveston, Texas; December 6, 1947; March 14, 1948; and March 20, 1948. About 20 mites, including males, females, nymphs, and larvae.

Charadrius alexandrinus, the snowy plover; Okaloosa County, Florida; April 8, 1951. Bob Elbel, collector. One female mite.

Sandpipers: Catophrophorus semipalmatus, the willet; Galveston, Texas; March 14, 1948; March 25, 1947; and April 3, 1948. About 15 mites, including all stages.

Totanus flavipes, the lesser yellow legs; Galveston, Texas; March 25, 1947. 4 mites.

Erolia alpina, Dunlin (=red-backed sandpiper). Galveston, Texas; March 20, 1948. I female mite.

Arquatella ptilocenemis, the Aleutian sandpiper. Eagle River, Alaska; October 29, 1949; R. B. Williams, collector. 1 female mite.

Crocethia alba, the sanderling, Galveston, Texas; November 30, 1947; March 14, 1948; and March 26, 1947. 3 mites, all female.

As is to be expected, there is some variation in the mites from these 8 hosts, but these variations are slight and intermediate conditions between extremes of variation exist.

Mites from the ringed plover have the dorsal sclerotized area well developed and meeting anteriorly, as depicted in the figure, and the ventral setae are apically attenuate. Mites from the dunlin (=red-backed sandpiper) and from the sanderling, have the dorsal sclerotizations more reduced and not meeting anteriorly, and the ventral setae have a very slender, subapical appendiculation. In mites from the snowy plover the dorsal sclerotizations are much reduced, as they also are in those from the turnstone. In both the latter the setae are not as prominently inflated as in the dunlin mites. Mites from the willet and yellow legs have rather well developed dorsal sclerotized areas and the ventral setae have apical attenuations. Variations in size, thickness of legs, and slenderness of the opisthosome are about the same for all hosts.

Rhinonyssus himantopus Strandtmann

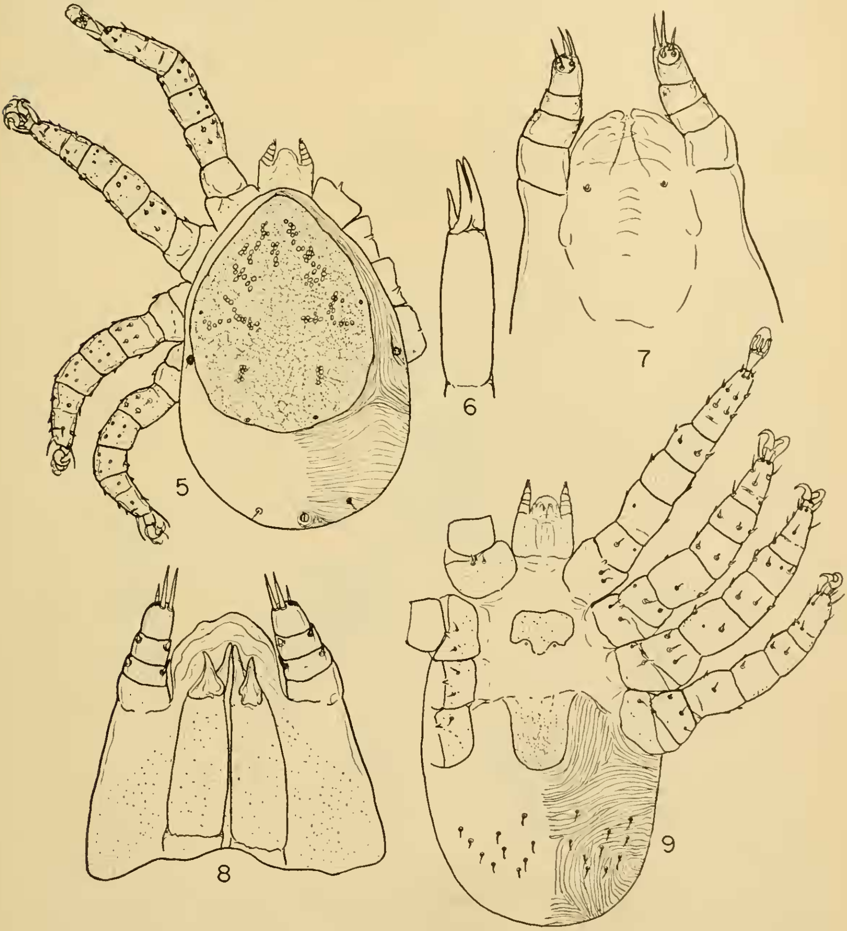
(Figs. 5, 6, 7, 8, 9)

Strandtman, 1951:136. Male, female and larva are described; male and female illustrated.

A fairly large, rather rounded mite. The female is about 800μ and the male about 700 μ long.

In addition to the characters in the key, the mite has the following distinguishing features: a large and prominent dorsal plate; a remnant of the sternal plate; apparent loss of sternal setae.

It has been recovered only from the type host, the black necked stilt, *Himantopus mexicanus*. Our records are: Kleberg County, Texas; September 11, 1949; Larry Cavazos, collector; 8 mites: Cocoa, Florida; June 9, 1954; R. O. Albert, collector; 4 female mites, one with larva.



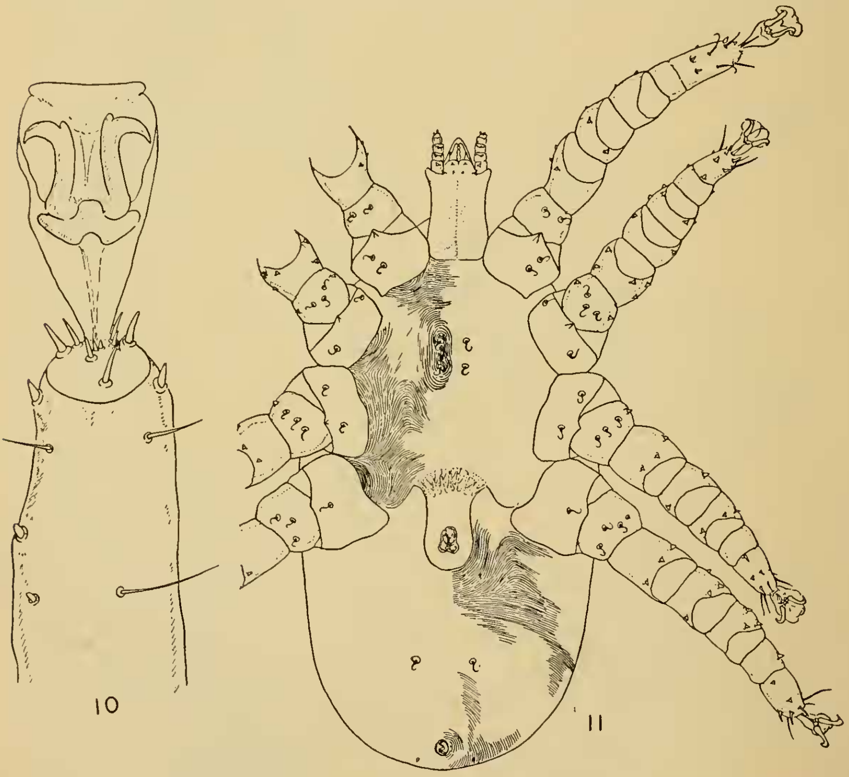
Rhinonyssus himantopus Strandtmann: fig. 5, dorsal view of female; fig. 6, male chelicera; fig. 7, ventral view of female gnathosoma; fig. 8, dorsal view of female gnathosoma with chelicerae; fig. 9, ventral view of female.

Rhinonyssus waterstoni Hirst

Hirst, 1921:359. Female briefly described and illustrated in ventral view. de Castro, 1948. Type host, the razor bill auk, *Alca torda.*
Synonym.—Sternostomum waterstoni, Vitzthum, 1935.

The present writer has not seen this species. Hirst's description is quoted below in its entirety.

''Female.—Abdomen not elongated. Very minute spinules are present on the venter in this species, instead of the hairs that are present in *R. caledonicus.* Capitulum short; segments of palp very short, being very much wider than long; tarsal segment very small, the conical tubercle on it well developed. Legs not very long, the first pair apparently slightly shorter than the fourth. Coxae with very short spinules or hairlets instead of the fairly long hairs present in *R. caledonicus.* Spines on legs much weaker than in *R. neglectus.* Claw of first leg apparently without any dorsal process.



Rhinonyssus caledonicus Hirst: fig. 10, tarsus I of female, dorsal view; fig 11, ventral view of female.

Length.—0.96 mm.

Habitat.—Nasal cavities of the Razorbill (*Alca torda*), Ollaberry, North

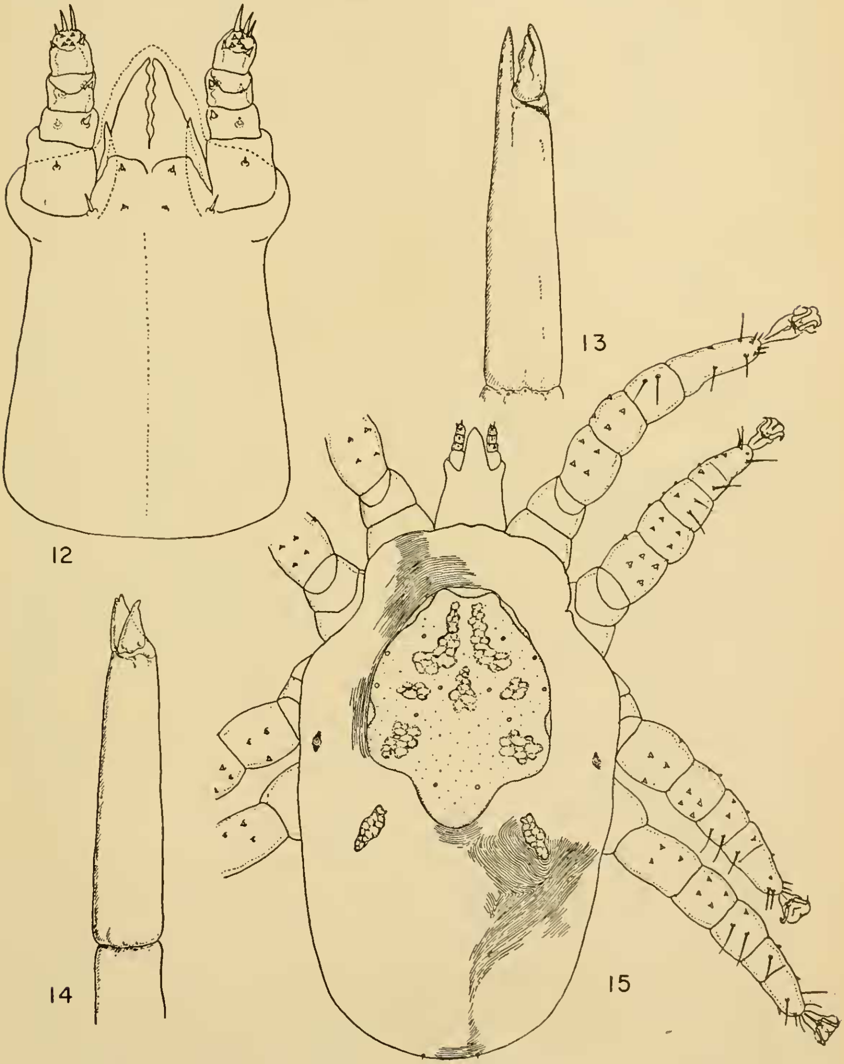
Mavine, Shetland Islands. Specimens collected by James Waterston (15. xii. 1913).''

Rhinonyssus caledonicus Hirst

(Figs. 10, 11, 12, 13, 14, 15)

Hirst, 1921:357. A brief description plus a ventral view of the female; (Type host: *Uria grylle,* (Black Guillemot). de Castro, 1948.

Synonym.—Sternostomum caledonicum, Vitzthum, 1935.



Rhinonyssus caledonicus Hirst: fig. 12, gnathosoma of female, ventral view; fig. 13, male chelicera; fig. 14, female chelicera; fig. 15, dorsal view of female.

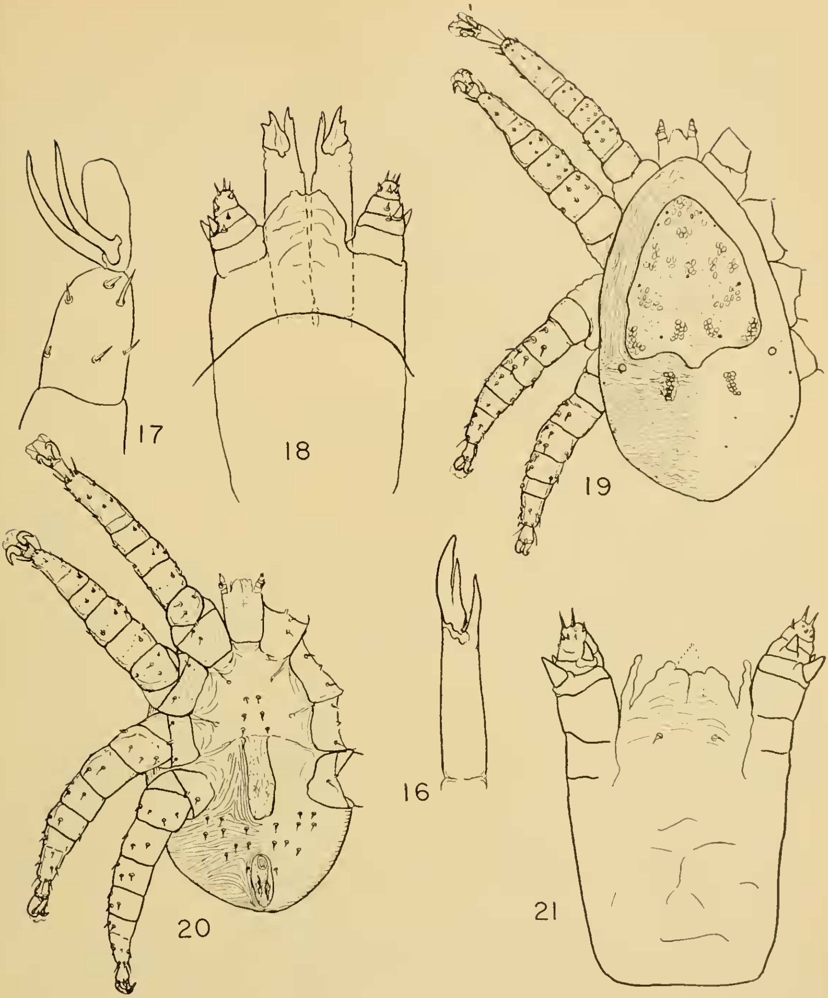
Several specimens from the Rhinocerus auklet were received through the kindness of Dr. R. O. Albert. They are apparently *R. caledonicus* although they have only two pairs of sternal setae instead of three.

Female.—Length; 1500 μ; dorsal plate 587 μ long, 450 μ wide. *Venter.* No sternal nor anal plates. Epigynial plate without setae but with a pair of small pores or setal bases posterior to it. One pair of rather prominent setae about midway between the epigynial plate and the anal pore, and one pair of smaller setae lateral and posterior to the anus. Only two pairs of sternal setae. *Dorsal.* One large podosomal shield, the posterior margin of which is strongly produced. Two small platelets lie posterior to the plate. There are six pairs of setal bases on the plate, but no setae. The dorsal surface otherwise is also devoid of setae. Stigma without platelet or peritreme. *Gnathosoma.* (The terminology as proposed by Gorirossi and Wharton (1953) is used.) Lacking are the deutosternal and gnathosomal setae. All three pairs of hypostomal setae are present; the anterior and inner basal are quite short, the outer basal longer. The palp trochanter has one small ventral seta; the femur has two setae, one dorsal, one ventral; the genu has three, two dorsal and one ventral; and the tibia has two, both ventral. The palp tarsus has a cluster of tiny setae and two to three long setae. The movable digit of the female chela is slightly reflexed at the tip; the immovable digit is apically bifid. The male chela has the spermatodactyl only slightly produced beyond the movable digit. The immovable digit is straight, simple, and as long as the spermatodactyl. The hypostomal processes appear as fleshy lobes. An epipharynx does not show. The tectum is smooth and nearly as long as the palps. One specimen shows a pair of rather short and heavy salivary stylets. *Legs.* The coxal setae and ventral setae of the trochanters are thin and flexible. The femora, genuae, and tibiae of all legs have short, thick setae but dorsally the tibiae also have a pair of long, slender setae. The tarsi also have short, thick setae but basally. Apically they are long and slender, especially on tarsus I.

Male.—Length. 1450 μ; dorsal plate 510 μ long, 390 μ wide. Differs from the female only in the chelae and in having a male gonopore. Plates and chaetotaxy as in the female.

Immature stages were not found.

Hirst's description was based on specimens taken from the black guillemot, collected on the Shetland Islands in February, March, and October, 1912 by James Waterston. Our description was based on three specimens, 1 male and 2 females, taken from *Cerorhincha monocerata*, the Rhinocerus auklet, collected in Puget Sound, Bremerton, Washington, North America, on March 1, 1952 by Dr. R. O. Albert.



Rhinonyssus rhinolethrum (Trouessart): fig. 16, male chelicera; fig. 17, tarsus I of larva; fig. 18, female gnathosoma, dorsal view, showing chelicerae; fig. 19, dorsal view of female; fig. 20, ventral view of female; fig. 21, female gnathosoma, ventral view.

Rhinonyssus rhinolethrum (Trouessart)

(Figs. 16, 17, 18, 19, 20, 21)

Sternostomum rhinolethrum Trouessart, 1895:393. Briefly described but not illustrated. (Type host, the domestic goose). Berlese, 1912:71, illustrated. Vitzthum, 1935. Vitzthum, 1941:656.

Rhinonyssus rhinolethrum (Trouessart), de Castro, 1948. Strandtmann, 1951: 132; redescribed, with illustrations of the male, female, and nymph as well as details of the gnathosoma.

Sommatericola levinsini Tragardh, 1904:29. Both sexes described and illustrated. Type host, eider duck, *Sommateria mollissima.*

Sternostomum levinsini, Vitzhum, 1935.

Rhinonyssus levinsini, Hirst, 1921, de Castro, 1948.

Rhinonyssus dartevellei Fain and Vercammen—Grandjean, 1953. Described and illustrated from eleven females, one nymph and three larvae. Type host, the spur-winged goose, *Plectropterus gambensis.*

This is a fairly large mite, up to 1.5 mm. long but the average length is slightly less than 1 mm. Distinguishing characters are the very heavy palpal setae, narrow anal plate, and seven to fourteen pairs of basally swollen but attenuated ventral setae.

This is a common mite in Anseriforme birds. Our records include the following:

Swans: *Cygnus columbianus*, the whistling swan. Norman, California; March 6, 1951; R. O. Albert, collector. Four specimens, 2 females and 2 nymphs, one of the females containing a larva.

Geese: *Branta canadensis*, the Canada goose. Muleshoe, Texas; February 11, 1950. One mite, a female.

Ducks: *Anas platyrhynchus*, the mallard. Coleman County, Texas; December 30, 1949; W. F. Cox, collector. Two mites.

Anas strepera, the gadwall. Matagorda County, Texas; January 18, 1948. Two heads yielded eight mites, one male, four females, three nymphs. Northwest Texas; November 13, 1951. Nineteen mites, of which 14 are females (one with larva, two with eggs) and 5 nymphs (two ready to molt). Earl Camp collector.

Mergansers: *Mergus merganser*, the American merganser. Several specimens, including 2 females with larvae. Collected in New England by Lawrence R. Penner.

Mergus sp. (probably *serrator*, the redbreasted merganser). Lubbock County, Texas; December 5, 1952; Anne McCaig, collector. Four mites, 2 of which had larvae.

From the literature may be added the domestic goose, the eider duck, and the spur-winged goose. We have also found one specimen, which may be an accidental record, in a head of a coot, *Fullica* sp. collected in Thailand and sent to us through the courtesy of Bob Elbel.

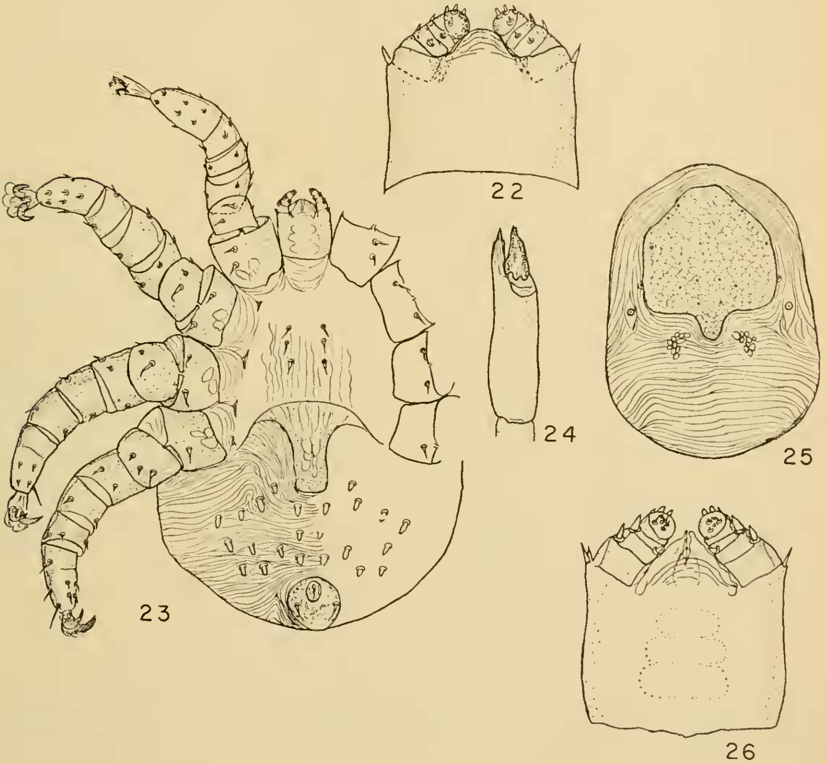
We have not seen specimens of *dartevellei* F. and V.-G. but the descriptions, illustrations and Anseriforme host argue powerfully for synonymy.

Mites from these hosts are strikingly similar, with the single exception of the swan. Mites from the swan have the posterior margin of the dorsal plate slightly eroded and the palpal setae are much reduced. A striking feature of the species is the exceptionally long tarsal claws of the larva. We have not seen any other related mite in which the claws are so well developed.

Anas acuta, the pintail. Muleshoe Wildfowl Reservation, Muleshoe, Texas; January 28, 1950. Four heads examined, 2 mites found in one of them.

Anas carolinensis, the greenwinged teal. Norman, California; January 14, 1951; R. O. Albert, collector. Three mites, 2 females and 1 nymph.

Mareca americana, the baldpate, or American wigeon. Muleshoe Wildfowl Refuge, Muleshoe, Texas; February 11. 1950. Examined 6 heads and found 2 mites, both females.

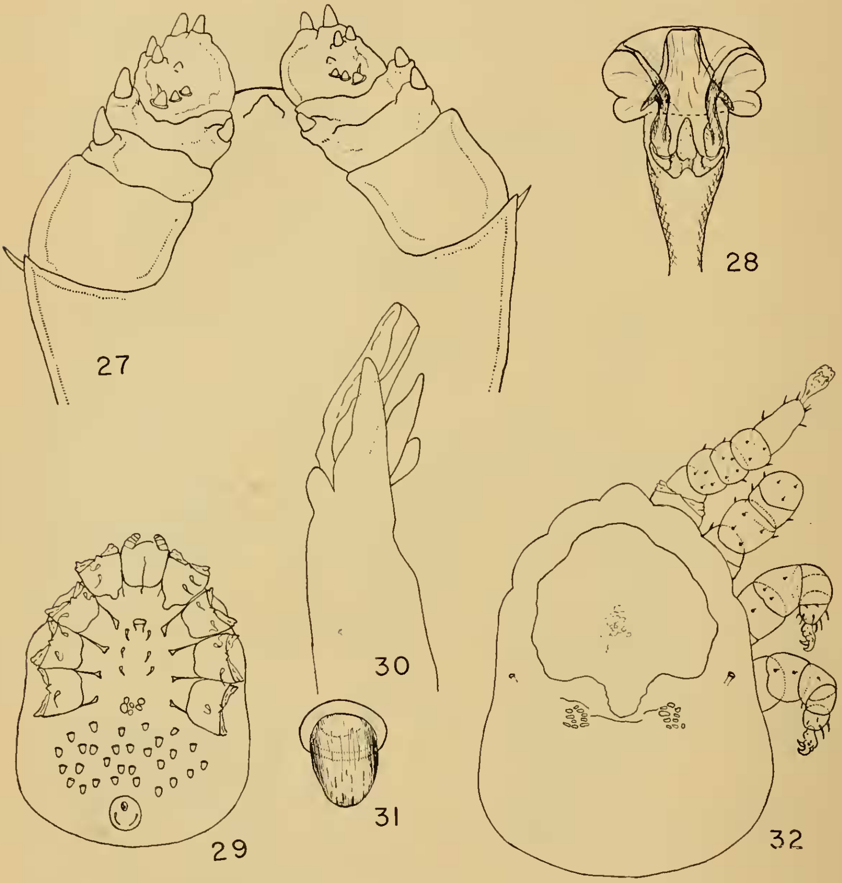


Rhinonyssus alberti, n. sp.; fig. 22, female gnathosoma, dorsal view; fig. 23, ventral view of female; fig. 24, female chelicera; fig. 25, dorsum of female; fig. 26, female gnathosoma, ventral view.

Spatula clypeata, the shoveler. Kleberg County, Texas; December 25, 1949; Larry Cavazos, collector. Four heads examined, two mites found, one female and one nymph.

Aythya affinis, the lesser scaup. Kleberg County, Texas; December 25, 1949. One mite, female.

Melanitta deglandi, the whitewinged scoter. Puget Sound, Bremerton, Washington; R. O. Albert, collector. One mite, a male.



Rhinosyssus alberti, n. sp.: fig. 27, gnathosomal palps, ventral view; fig. 28, claws and ambulacrum of tarsus I, female; fig. 29, ventral view of male; fig. 30, male chela; fig. 31, ventral seta, enlarged; fig. 32, dorsal view of female.

Rhinonyssus alberti, new species
(Figs. 22-32)

This new species from grebes is more closely related to *rhinolethrum* (from ducks, geese, etc.) than to any other *Rhinonyssus*. The female is about 800 μ long by 500 μ wide; the male is about 640 μ by 480 μ. The palps have blunt, heavy setae and the venter bears 10 to 15 pairs of very heavy, short, blunt setae. There is an anal plate but it bears only two setae and lacks a cribrum.

Female.—Varying in length from 720 μ to 890 μ, averaging just a little over 800 μ. *Venter.* No sternal plate. The six sternal setae are swollen basally and attenuate evenly into thin, flexible tips. The epigynial plate is about twice as long as wide and devoid of setae but it is sclerotized and pigmented. The venter bears from ten to fifteen pairs of prominent, broad, blunt setae. The anal plate is present but not sclerotized. It is rounded, bears two setae, and lacks a cribrum. The anal pore is near the anterior margin. *Dorsum.* A large, well sclerotized, lightly reticulated podosomal plate which is narrowly and bluntly produced on the posterior margin. Two small platelets lie posterior to the podosomal shield. There are no stigmal plates. The entire dorsal surface is devoid of setae. *Gnathosoma.* The pedipalps are short and stubby but bear prominent heavy setae. One rather slender seta is at the outer base of the palp trochanter (or at the apex of the coxa?). The palp femur has a short heavy seta on the outer margin and the palp genu has a seta on both the inner and outer margins, the palp tibia seems to have two or three heavy, blunt setae at the apex, and the small tarsus has several indistinct, knoblike setae. There are no hypostomal setae, no deutosternal setae and no gnathosomal setae. An epipharynx does not show. The tectum is a fairly short, rounded lobe. The chelae are about ¼ the total length of the chelicerae. Both arms are equally developed and are straight and thick and devoid of teeth. *Legs.* The coxal setae have slender tips which arise gradually from swollen bases. The trochanters have similar setae but smaller. The rest of the leg segments have short, rigid setae with the exception of the tarsi, which bear long, slender setae apically.

Male.—Average length, 640 μ; width, 480 μ. Gnathosoma, dorsal surface and chaetotaxy of legs as in the female. Anal plate as in the female. Ventral setae same morphologically as in female but numbering 26-28. *Genital pore* just anterior to the first pair of sternal setae. No sternal plate. A small, indistinct plate is located between coxae IV. The *chela* is difficult to delineate clearly. The immovable arm is slender, straight and edentate. The movable arm is a trifle longer, is quite broad, and seems to have an appressed appendage basally. The spermatodactyl is considerably longer, but is equally as broad as the movable arm. It seems to be either forked or broadly cupped apically.

Nymph.—Length 620 μ. Chaetotaxy quite similar to that of the female. The dorsal shield is extremely vague. The ventral side has only the anal shield. Number of ventral setae, 28-30.

Types.—Holotype female, and several paratypes, including a male and nymph are in the acarology collection of the U. S. National Museum, Washington D. C. Paratype females have been sent also to Dr. Jean Cooreman at the Brussels Natural history Museum, Belgium; Dr. A. Fain, Ruanda Urundi, Astrida; Dr. F. Zumpt at the Medical Institute, Johannesburg, South Africa; and Dr. Deane Furman, University of California. The balance are in the collection of the author.

Type host. Colymbus caspicus, the eared grebe.

Type locality. Longbeach, California, North America.

The above description is based on 18 females, 3 males and 2 nymphs. They were found in the nasal passages of a single bird which was collected on December 30, 1951 by Richard O. Albert, M.D., in whose honor this distinctive mite is named.

SUMMARY

This paper includes the synonymy and description of the genus *Rhinonyssus*, a key to the known species, a brief description of the previously known forms, a detailed description of a new species, *R. alberti*, and illustrations of each species we have seen. The species *Rhinonyssus nova-guinea* is removed from the genus.

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ANNOUNCEMENT

Short scientific articles, not illustrated, two double-spaced typewritten pages or less in length, are welcome and will usually receive prompt publication. References to literature should be included in the text.